UNITED WATER IDAHO, INC.
MARDEN WATER TREATMENT PLANT PWS #4010016
SOURCE WATER ASSESSMENT REPORT

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State of Idaho
Department of Environmental Quality

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Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the watershed characteristics.

This report, *Source Water Assessment for United Water Idaho, Inc., Marden Water Treatment Plant (WTP),* describes the public drinking water system, the zone boundary of water contribution, and the associated potential contaminant sources located within this boundary. This assessment should be used as a planning tool, taking local knowledge and concerns into account, to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The United Water Idaho, Inc., Marden WTP drinking water system consists of one surface water intake system in the Boise River, located east of Municipal Park in Boise, Idaho (Figure 1). The system is equipped with a Raney well and river intake collectors.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

Due to the fairly short time associated with the movement of surface waters, source water protection activities should be aimed at short-term management strategies with the development of long-term management strategies to counter any future contamination threats. Source water protection activities should be coordinated with the City of Boise, Idaho Department of Lands, Idaho Department of Parks and Recreation, the U.S. Forest Service, the U.S. Bureau of Reclamation and other agencies.

A community with a fully developed source water protection program will incorporate many strategies. For assistance in developing protection strategies please contact your regional IDEQ office or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR UNITED WATER IDAHO, INC., MARDEN WTP

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area, a map showing the entire watershed contributing to the delineated area, a map showing the twenty-four (24) hour emergency response delineation, and the inventory of significant potential sources of contamination identified within the delineated area are attached. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is attached.

Background

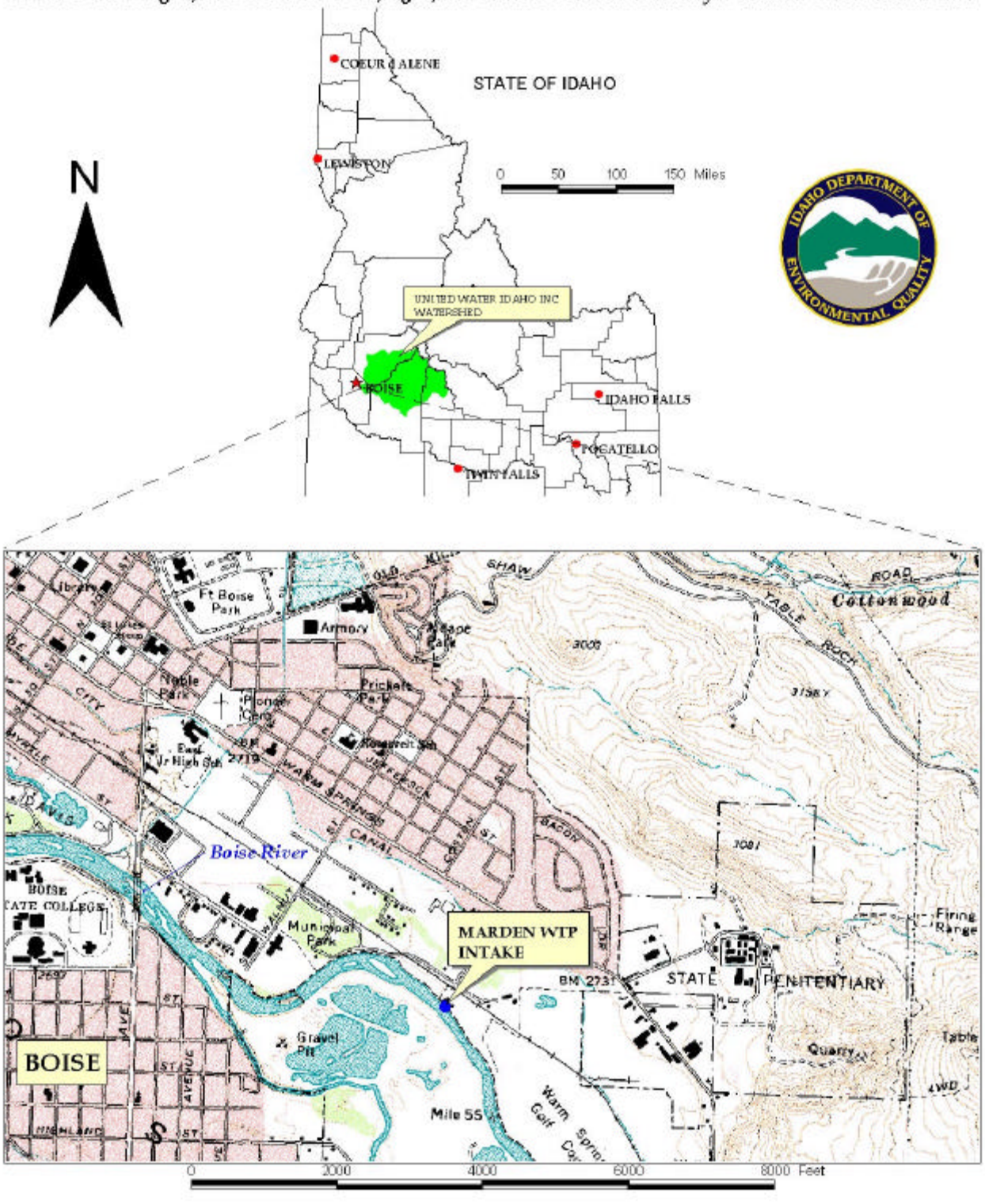
Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the intakes and watershed characteristics.

Level of Accuracy and Purpose of the Assessment

Over 2,900 public water sources in Idaho must be assessed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (IDEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. IDEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

FIGURE 1. Geographic Location & Topographic Watershed Delineation for United Water Idaho Inc.



Section 2. Conducting the Assessment

General Description of the Source Water Quality

The Marden WTP (water treatment plant) is a surface water intake system, owned and operated by United Water Idaho, Inc., a public utility serving Boise, Idaho. United Water Idaho, Inc. also has 88 ground water sources that will be assessed at a later date. United Water Idaho, Inc. serves approximately 186,000 people from the combination of sources. The Marden WTP intakes water from the Boise River and is located east of Municipal Park and west of Warm Springs Golf Course. The Boise River is a recreational amenity of the community.

Water quality issues currently facing the Marden WTP is the amount and varied types of possible contaminant sources within the delineated source water area. Another issue facing the system, and that of most surface water systems are possible bacterial (microbial) contamination and the problems associated with managing it. Surface water systems in general are vulnerable to bacterial contamination.

Defining the Zones of Contribution--Delineation

To protect surface water systems from such potential contaminant pathways, the EPA required that the entire drainage basin be delineated upstream from the intake to the hydrologic boundary of the drainage basin (U.S. EPA, 1997b). The EPA recognized that an intake on a large water body could have an extensive drainage basin. Therefore, the EPA recommended that large drainage basins be segmented into smaller areas for the purpose of implementing a cost-effective potential contaminant inventory and susceptibility analysis. The delineation process established the physical area around an intake that became the focal point of the assessment. This process included mapping the boundaries of the zone of contribution into a river buffer zone that extends from the intake upstream 25 miles or to the 4-hour streamflow time-of-travel boundary, whichever is greater. This buffer zone also extends up tributaries to the remainder of the 25-mile boundary or the 4-hour time-of-travel boundary. This time-of-travel boundary is based on gauge station information based on a 10-year flood event.

The delineated source water assessment area for United Water Idaho, Inc., Marden WTP can best be described as a buffered area, 500 feet on either side of the river that extends upstream 25 miles and includes stream reaches and tributaries that contribute to the Boise River flow. The delineation extends upstream to include Lucky Peak Reservoir, and beyond into the Robie Creek drainage and a portion of Arrowrock Reservoir (Figure 2). The actual data used by IDEQ in determining the source water assessment delineation are available upon request.

A delineation of the watershed and stream segments encompassed by a twenty-four hour time of travel, calculated from annual discharge rates was produced to provide system operators with a map for emergency response purposes. This map would allow the operators to be aware of the roads, railroads, and major sources of contamination that are located close to the stream network in case of a major spill which could impact their drinking water system intake. Stream velocity for time of travel estimates was calculated using the mean annual daily discharge. A 500-foot buffer on either side of major stream segments was used to identify major sources of contamination such as above ground storage tanks, NPDES discharge sites, and RCRA facilities (Figure 3).

This 24-hour emergency response delineation extends up to Lucky Peak Dam. Beyond the dam, the Boise River is contained within a reservoir and is considered a lake in which case the velocity is considered minimal for the

24-hour emergency response criteria (Figure 3). The discharge of the Boise River is controlled upstream by Lucky Peak, Arrowrock and Anderson Ranch dams.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of surface water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by IDEQ and from available databases.

Land use within the United Water Idaho, Inc., Marden WTP source water delineated area consists predominantly of rangeland, with small amounts of agricultural, forested and urbanized land. Rural residential homes, suburban and urban subdivisions, small businesses, light manufacturing and recreational sites are scattered within the delineated area. Homes and businesses within the source water delineated area operate with both sewer systems and individual septic systems.

It is important to understand that a release may never occur from a potential source of contamination provided best management practices are being used. Many potential sources of contamination are regulated at the federal level, state level, or a combination of levels to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination. These involve educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply intake.

Contaminant Source Inventory Process

A contaminant inventory of the study area was conducted during September 2000. This involved identifying and documenting potential contaminant sources within the United Water Idaho, Inc., Marden WTP Source Water Assessment Area through the use of computer databases and Geographic Information System (GIS) maps developed by IDEQ.

A total of 43 potential contaminant sources are located within the delineated source water area (see Table 1). A majority of the potential contaminant sources within delineated source water areas are located within three miles upstream from the intake. Potential contaminant sources located in the delineated source water areas of United Water Idaho, Inc., WTP include businesses such as fuel, building materials, printers, dry cleaners, quarry/mines, waste water treatment, water treatment discharge and a landfill. (Figure 2).

Contaminants of concern are primarily related to volatile and synthetic organic contaminants, inorganic contaminants and microbial bacteria which may be related to the variety and amount of potential contaminant sources associated with the urban land use in the delineated source water area. Table 1 lists the potential contaminants of concern and information source. It should be noted that several of the LUST (leaking underground storage tank) sites have undergone cleanup and several UST (underground storage tank) sites are closed.

Table 1. United Water Idaho, Inc., Marden WTP Potential Contaminant Inventory

SITE #	Source Description	Source of Information	Potential Contaminants
1	LUST SITE	DATABASE SEARCH	VOC, SOC
2	LUST SITE	DATABASE SEARCH	VOC, SOC
3	LUST SITE	DATABASE SEARCH	VOC, SOC
4	LUST SITE	DATABASE SEARCH	VOC, SOC
5	UST SITE	DATABASE SEARCH	VOC, SOC
6	UST SITE	DATABASE SEARCH	VOC, SOC
7	UST SITE	DATABASE SEARCH	VOC, SOC
8	UST SITE	DATABASE SEARCH	VOC, SOC
9	UST SITE	DATABASE SEARCH	VOC, SOC
10	BML SITE, NURSERY	DATABASE SEARCH	IOC, SOC
11	BML SITE, BUILDERS	DATABASE SEARCH	IOC, VOC
12	BML SITE, CABINETS	DATABASE SEARCH	IOC, VOC
13	BML SITE, PRINTING	DATABASE SEARCH	IOC, VOC
14	BML SITE, PRINTING	DATABASE SEARCH	IOC, VOC
15	BML SITE, PRINTING	DATABASE SEARCH	IOC, VOC
16	BML, WOOD TREATMENT	DATABASE SEARCH	IOC, VOC, SOC
17	BML SITE, SAWMILL	DATABASE SEARCH	IOC, VOC
18	BML SITE, PRINTING	DATABASE SEARCH	IOC, VOC
19	BML SITE, MEDICAL	DATABASE SEARCH	M, IOC, SOC
20	BML SITE, FURNITURE	DATABASE SEARCH	IOC, VOC
21	BML SITE, DRY CLEANER	DATABASE SEARCH	VOC, SOC
22	NPDES, WATER TREATMENT	DATABASE SEARCH	M, IOC
23	NPDES, WATER TREATMENT	DATABASE SEARCH	M, IOC
24	RCRIS SITE	DATABASE SEARCH	SOC, VOC, IOC
25	RCRIS SITE	DATABASE SEARCH	SOC, VOC, IOC
26	RCRIS SITE	DATABASE SEARCH	SOC, VOC, IOC
27	MINE/PROSPECT	DATABASE SEARCH	IOC, VOC
28	MINE/PROSPECT	DATABASE SEARCH	IOC, VOC
29	MINE/GRAVEL	DATABASE SEARCH	IOC, VOC
30	MINE	DATABASE SEARCH	IOC, VOC
31	MINE	DATABASE SEARCH	IOC, VOC
32	MINE	DATABASE SEARCH	IOC, VOC
33	MINE	DATABASE SEARCH	IOC, VOC
34	MINE	DATABASE SEARCH	IOC, VOC
35	MINE	DATABASE SEARCH	IOC, VOC
36	MINE/QUARRY	DATABASE SEARCH	IOC, VOC
37	MINE	DATABASE SEARCH	IOC, VOC
38	MINE	DATABASE SEARCH	IOC, VOC
39	MINE	DATABASE SEARCH	IOC, VOC
40	MINE	DATABASE SEARCH	IOC, VOC
41	ABOVE GRND STORG TANK	ENHANCED INVENTORY	VOC, SOC
42	WLAP SITE, WASTE WATER TRTMNT	DATABASE SEARCH	M, IOC
43	SEPTIC	ENHANCED INVENTORY	M
44	LANDFILL	ENHANCED INVENTORY	M, IOC, SOC, VOC

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical, M =microbial

Susceptibility Analyses

Significant potential sources of contamination were ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity and construction of the intake, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each intake is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Intake Construction

The construction of a public water system's intake directly affects the ability of the intake to protect the source from contaminants. The United Water Idaho, Inc., Marden WTP drinking water system consists of a river intake collector system that produces surface water for domestic and industrial uses. The river intake is located in the Boise River in the east end of Boise, between Municipal Park and Warm Springs Golf Course. The system is equipped with a raney well that acts as an infiltration gallery. The Marden WTP intake system rated low in susceptibility with respect to construction.

Potential Contaminant Source and Land Use

The Marden WTP intake system rated in the moderate susceptibility category overall due to the number of potential contaminant sources within the large delineated area. The delineated area consists of approximately 20,581 acres. A large variety of potential contaminant sources exist within the delineated area, with a majority in the urban/suburban areas that are within 3 miles upstream from the intake. The intake rated in the moderate category for the inorganic chemical class, volatile organic chemicals, synthetic organic chemicals and microbial bacteria.

In terms of the total susceptibility score, it can be seen from Table 2 that the system showed a moderate susceptibility to microbial contamination, which is generally related to septic system density, grazing impacts and general surface exposure. The system is also moderately susceptible to inorganic, volatile organic and synthetic organic contaminants due to the number of potential sources within the source water delineated area.

Table 2. Summary of United Water Idaho, Inc., WTP Susceptibility Evaluation

Table 2. Summary of United Water Idaho, Inc., Marden WTP.	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
	IOC	VOC	SOC	Microbial		IOC	VOC	SOC	Microbial
Boise River	M	M	M	M	L	M	M	M	M

H = High Susceptibility, M = Moderate Susceptibility, Low Susceptibility
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical
H* - Indicates source automatically scored as high susceptibility to contamination due to the presence of a VOC, SOC or Microbial contaminant in the finished drinking water

Susceptibility Summary

The United Water Idaho, Inc., Marden WTP drinking water system is moderately susceptible to microbial contamination due to the natural vulnerability of surface water systems. The system also has a moderate susceptibility ranking for inorganic, volatile organic and synthetic organic chemical contaminants due to the number of potential sources. The system has a low susceptibility in terms of intake construction. The system is also subject to turbidity due to activities that occur along the stream banks.

Section 3. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. For United Water Idaho, Inc., Marden WTP, source water protection activities should focus on environmental education with the community, recreational users and businesses that operate within the vicinity of the delineation. Education should focus on proper disposal and the implementation of practices aimed at reducing the impacts of turbidity and microbial contamination within the delineated source water areas. Most of the delineated areas are outside the direct jurisdiction of United Water Idaho, Inc. Due to the relatively short time involved with the movement of surface water, source water protection activities should be aimed at short-term management strategies with an emphasis on dealing with long-term future impacts from these same sources. Source water protection activities should be coordinated with the City of Boise, Ada County, Idaho Department of Lands, Idaho Department of Parks and Recreation, the U.S. Bureau of Reclamation, the U.S. Forest Service and other agencies.

Assistance

Public water supplies and others may call the following IDEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the IDEQ office for preliminary review and comments.

Boise Regional IDEQ Office (208) 373-0550

State IDEQ Office (208) 373-0502

Website: http://www2.state.id.us/deq

References Cited

EPA (U.S. Environmental Protection Agency), 1997, State Methods for Delineating Source Water Protection Areas for Surface Water Supplied Sources of Drinking Water, EPA 816-R-97-008, 40p.

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997, "Recommended Standards for Water Works"

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Dept. of Environmental Quality, 1999, Idaho Source Water Assessment Plan

Howarth, Rob, 1996, Ground Water Quality Technical Report No. 7, An Evaluation of Bacteria in Ground Water Near Mountain Home, Elmore County, Idaho, Idaho Division of Environmental Quality, Southwest Idaho Regional Office

U.S. Government Printing Office, 1995, Code of Federal Regulations, 40 CFR 112, Appendix C-III, Calculation of the Planning Distance

Attachment A

United Water Idaho, Inc., Marden WTP Susceptibility Analysis Worksheet

The final scores for the susceptibility analysis were determined from the addition of the Potential Contaminant Source/Land Use Score and Source Construction Score.

Final Susceptibility Scoring:

0 - 7 Low Susceptibility

8 - 15 Moderate Susceptibility

$ 16 High Susceptibility

Surface Water Susceptibility Report Public Water System Name : UNITED WATER IDAHO INC Intake# : MARDEN WTP

Public Water System Number 4010016 10/10/00 3:46:41 PM

1. System Construction		SCORE
Intake structure properly constructed	YES	0
Infiltration gallery or well under the direct influence of Surface Water	YES	0
Total System Construction Score		0

2. Potential Contaminant Source / Land Use		IOC Score	VOC Score	SOC Score	Microbial Score
Predominant land use type (land use or cover)	URBAN/COMMERCIAL	2	2	2	2
Farm chemical use high	NO	0	0	0	
Significant contaminant sources *	NO				
Sources of class II or III contaminants or microbials	present within the 500' of the intake and the	4	4	4	4
Agricultural lands within 500 feet	NO	0	0	0	0
Three or more contaminant sources	YES	1	1	1	0
Sources of turbidity in the watershed	YES	1	1	1	1
Total Potential Contaminant Source / Land Use Score		12	12	12	11
3. Final Susceptibility Source Score		12	12	12	11
4. Final Source Ranking		Moderate	Moderate	Moderate	Moderate

* Special consideration due to significant contaminant sources
The source water has no special susceptibility concerns

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund@ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (IDEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100 year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by IDEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.